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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/682,540	09/17/2001	Mats Danielsson	GPD0021-US	5619

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EXAMINER
HOBDEN, PAMELA R

ART UNIT	PAPER NUMBER
2882	

DATE MAILED: 12/19/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/682,540	DANIELSSON, MATS	
	Examiner	Art Unit	
	Pamela R. Hobden	2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 September 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☒ Claim(s) *10,15* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Objections

1. Claim 10 is objected to because of the following informalities: Line 2 has "silicon waters" Suggested change would be "wafers". Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 6 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The specification does not describe how all of these different types of detectors operate together. The addition of "or" would correct this problem.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in-
> (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application

published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

5. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Schiebel et al (US 5,396,072). Schiebel et al discloses an arrangement for detecting x-ray radiation comprising a carrying member (13), arranged on at least one side with one or more detectors comprising a plurality of sensors (11) provided on a substrate, wherein the detectors are arranged substantially edge to edge and side by side at least in one row on at least the one side of the carrying member (figure 3), and the detector further comprises a sensor plane (figure 3). It is inherent to one skilled in the art to arrange a sensor plane in an angle incident to x-ray beams.

6. Claim 1,2,4,5 is rejected under 35 U.S.C. 102(e) as being anticipated by Schick et al (US 5,834782). Schick et al discloses an arrangement for detecting x-ray radiation comprising a carrying member (figure 3), arranged on at least one side with one or more detectors comprising a plurality of sensors (11-29) provided on a substrate, wherein the detectors are arranged substantially edge to edge and side by side at least in one row on at least the one side of the carrying member (figure 3), and the detector further comprises a sensor plane (figure 3;39). It is inherent to one skilled in the art to arrange a sensor plane in an angle incident to x-ray beams.

Regarding Claim 2: The at least two detectors are arranged in at least two levels and displaced relative to each other such that an inactive section on one detector is overlapped with an active area of the other electrode (figure 4C, 5).

Regarding Claim 4: The carrying member is tilted to arrange the sensor plane in the angle. (Figure 4C)

Regarding claim 5: The detector is arranged on a supporting member (30) (figure 4A).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schick et al. Schick et al.'s disclosure is as shown above. Schick et al fails to specifically disclose a system wherein the sensor plane is arranged in parallel to incident x-ray beams. Schick however, does disclose a sensor array wherein there is a significant angle to each detector. (figure 4c) It would be obvious to one skilled in the art to continue to modify the angle as disclosed by Schick et al in order to prevent the striking of incident x-ray beams. One would be motivated to modify the angulation of the

detector structure if one wanted to disable the detector for transmission x-rays, and were instead looking to only read the presence of backscatter from an object.

9. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schick et al. Schick et al discloses a detector as shown above. He also discloses a detector further comprised of a scintillator (column 7 line 17) optically connected to a CCD (Column 7 line 16-24), He fails to disclose silicon diodes, a gaseous detector or a parallel plate chamber where the gas volume is oriented edge-on to the incident x-rays. Absent a showing of criticality, it would be obvious to one skilled in the art to incorporate any one of the above mentioned detectors. It would be a design choice.

10. Claims 7,8,11,13, 14, and 18-20 rejected under 35 U.S.C. 103(a) as being unpatentable over Schick et al (US 5,834,782). Schick et al.'s disclosure is as shown above. Schick also discloses Schick fails to disclose an x-ray apparatus comprising a planar member of a material non-transparent to x-rays having an elongated slot formed therein (a collimator), and an array of detectors provided in communication with the slots and arranged to detect x-rays and for providing a signal representing the intensity of the x-rays imaging thereon, means for moving a beam directing member and an object to be examined relative each other, wherein the array of detectors comprises substantially in parallel arranged detector arrangements.

Official notice is taken that it would be obvious to one skilled in the art to develop an x-ray apparatus comprising a planar member of a material non-transparent to x-rays having an elongated slot formed therein (a collimator), and an array of detectors provided in communication with the slots and arranged to detect x-rays and for

providing a signal representing the intensity of the x-rays imaging thereon, means for moving a beam directing member and an object to be examined relative each other, wherein the array of detectors comprises substantially in parallel arranged detector arrangements. The x-ray system as described in the preamble of the claim has every feature as needed for a basic x-ray system: (a) collimator, (b) detectors in line with a collimator, (c) a c-arm to move the beam directing member (collimator holder), (d) an object, (e) and parallel arranged detector arrangements. (standard configuration of a CT scan system, also, set up at angles, parallel to each other.)

The detector as described in Claim 1 could be set into any x-ray system, and would be a design choice. One would be motivated to substitute the detector of the applicant's into any standard x-ray system in order to improve the image quality in the presence of adjacent dead cells in the detector array.

Regarding claim 13: Schick fails to disclose an apparatus wherein the beam directing member is arranged with slots in at least two rows and slots in each row are displaced relative to each other. It would be obvious to one skilled in the art to have multiple rows for the collimator, with some displacement in reference to each other. It is a standard process for design of a collimator. One must have multiple rows for the collimator in order to get the appropriate beam width upon the object. If one were only to have one row, it would have to be substantially wider, or very close to the source inorder to have the widest beam width, and would not well control the beam. One would be motivated to have muliple rows and slots in each row displaced relative to each other

because multiple rows allows for better image collection, and reduces extraneous noise on the detector.

Regarding claim 14: Schick fails to disclose a beam directing member that is refracting or focusing. It would be obvious to one skilled in the art to have a refracting or focusing member. One would be motivated to have a focusing member in order to improve image quality, and to make the image sharper.

Regarding claim 18-20: Schick fails to specifically disclose the following steps:

(1) starting a scan;

(2) when the scan starts, providing the slots and corresponding detectors substantially outside a field of view;

(3) passing substantially all slots and corresponding detectors the object and thus the said field of view;

(4) measuring scan x-ray fluxes together with position coordinates for all detectors;

(5) terminating the scan only after all slots and corresponding detectors are substantially outside the field of view.

It would be obvious to one skilled in the art to follow the previous steps in any standard CT system. One would be motivated to follow the preceding steps in any CT system in order to take an image. They are necessary steps in the imaging of an object, and one would choose the detector of Schick's in a CT to improve the image quality in the presence of adjacent dead cells in the detector array.

Regarding claim 21: Schick fails to specifically disclose a method wherein readout data for each increment and for each sensor array is stored as data arrays, and wherein the stored data for each sensor array is separately combined to form an image,

and wherein images obtained by each sensor array is superimposed to form a final image. It would be obvious to one skilled in the art to utilize a method wherein readout data for each increment and for each sensor array is stored as data arrays, and wherein the stored data for each sensor array is separately combined to form an image, and wherein images obtained by each sensor array is superimposed to form a final image. Official notice is taken that this is a standard image/data processing technique, and it would be a design choice, and one of ordinary skill in the art would be motivated to employ this technique in order to minimize the need for error correction in the image.

11. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schick et al. Shick's disclosure is as shown above. Schick fails to specifically disclose a means to acquire data from the detector arrays at intervals corresponding to a fraction of the width of the sensor arrays. It would be obvious to one skilled in the art to process data collection in this manner. It is a standard process when using detectors, and collecting image data. One would be motivated to move at intervals corresponding to a fraction of the width of the sensor array when a portion of a detector is covered, in order to move to a position where another detector can start picking up the image. By increasing the data collection, better error correction is available.

12. Claim 10 rejected under 35 U.S.C. 103(a) as being unpatentable over Schick et al. Schick's disclosure is as shown above. Schick specifically fails to disclose a detector array made of silicon wafers oriented edge-on to the incident x-ray. Absent a showing of criticality, it would be obvious to one skilled in the art to incorporate Schicks design with this orientation as a design choice One would be motivated to orient the

wafers edge-on if one wanted to minimize the penetration of transmission x-rays, and maximize backscatter x-rays upon the detector..

13. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schick et al. Claim 12 rejected under 35 U.S.C. 103(a) as being unpatentable over Schick et al as applied to claim 7 above. Schick et al.'s disclosure is as shown above. Schick et al fails to specifically disclose a system wherein the sensor plane is arranged in parallel to incident x-ray beams. Schick however, does disclose a sensor array wherein there is a significant angle to each detector. (figure 4c) It would be obvious to one skilled in the art to continue to modify the angle as disclosed by Schick et al in order to prevent the striking of incident x-ray beams. One would be motivated to modify the angulation of the detector structure if one wanted to disable the detector for transmission x-rays, and were instead looking to only read the presence of backscatter from an object.

Allowable Subject Matter

14. Claims 15-17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Prior art does not disclose starting a scan from a first position, with the collimators and detectors having a first speed, bringing the collimators and detectors at a maximum constant speed when all of the collimators and detectors are in the field of view, and bringing the collimators and detectors to a third speed when the first collimator is outside the field of view.

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pamela R. Hobden whose telephone number is (703)-306-5435. The examiner can normally be reached on Monday-Thursday 8:30-6:00, Alternating Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (703)-305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703)-308-7382 for regular communications and (703)-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)-308-0956.

prh
December 17, 2001

David P. Porta
Primary Examiner